

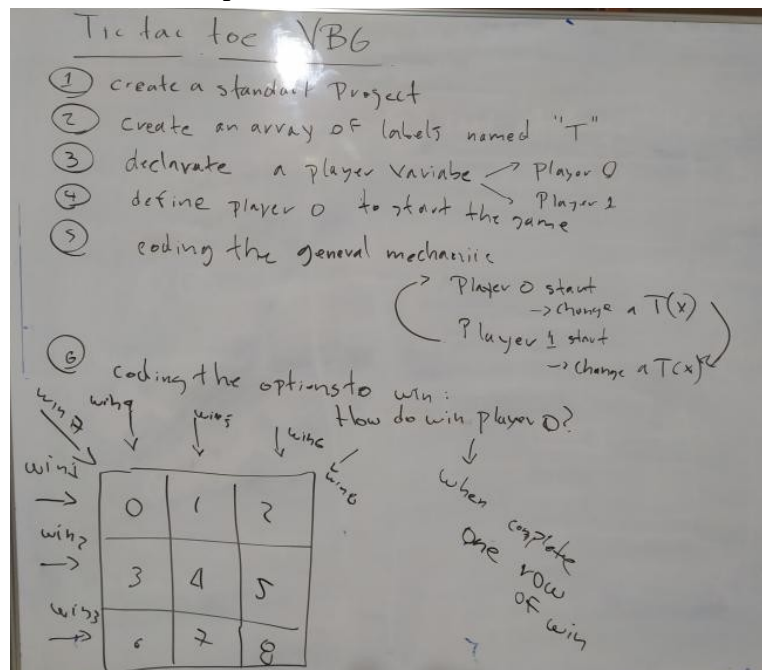
## The language: Visual Basic

Our version of Tic Tac Toe is built in Visual Basic. Visual Basic is an event-driven programming language. It is a BASIC dialect with important additions.

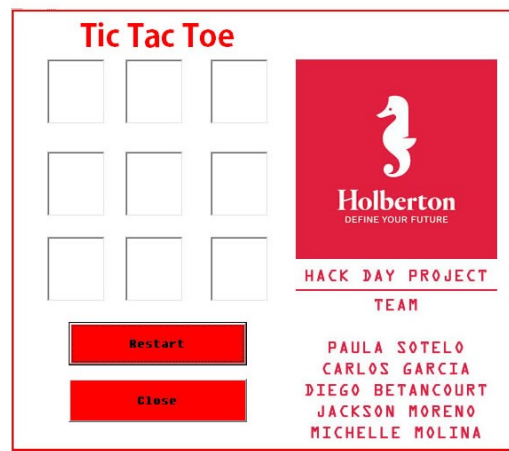
Visual Basic has an integrated environment that integrates a text editor for editing the source code, a debugger, a compiler and a graphical interface editor (GUI)

## Algorithm put in place

The planning of the game has some steps:



1. Creating the project: The project was done in Visual Basic 6.0.
2. Creating the matrix: Each Tic Tac Toe field is part of a matrix called "T". This matrix is known in Visual Basic as a label matrix.
3. Player variable declaration: There are two players: 0 and 1.
4. Definition of the player who will start the game: Player 0 will always start first.
5. Coding of the general mechanics: The player who has three fields in line will win. Let us explain this algorithm in detail:



Each player must only place his symbol once per turn and it must not be on a square already played. In case the player cheats, the other player is the winner. A straight line or diagonal must be made for each symbol. If the player marks a square, even the smallest one, he must place the symbol for the next move on that square.

You can make horizontal, vertical and diagonal movements. For this reason, we have 8 positions (opportunities) in our matrix that make a player a winner. Please see the image if you can't visualize what we are talking about.

Thus, when a player clicks on a field, it will change color (black for player 0 and yellow for player 1).

Once a block has been selected for one player, it cannot be selected for the other player. The game is played by rotating the system, first one player, then the other, and so on.

The game has two buttons: restart and close. Its function is, as its name indicates, to restart the game and finish it.

And for close:

```
Private Sub Command2_Click()
```

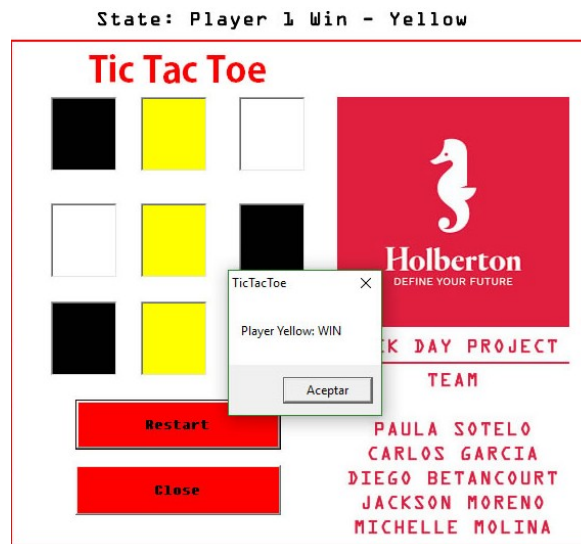
```
End
```

```
End Sub
```

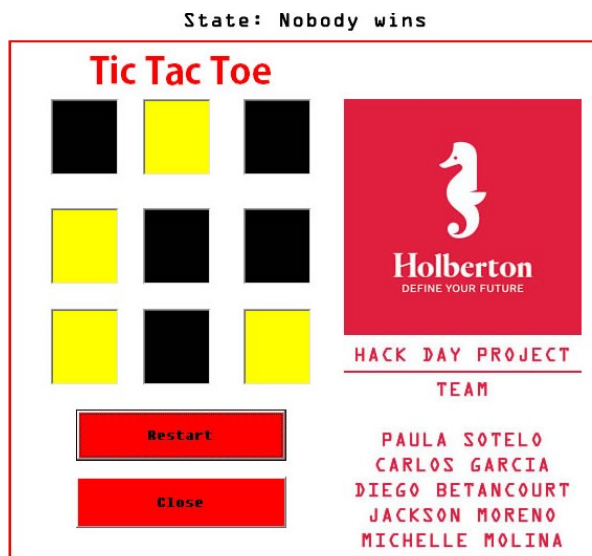
## Users flow to play

The game starts at the head of player 0. Once player 0 selects the first block, it will turn black. The turn is for player 1, who will select another yellow block. The game ends in two cases:

Case 1. One of the players completes 3 consecutive blocks vertically, horizontally or diagonally.



Case 2: None of the players manage to complete 3 blocks in a row, a situation that is reached when there are no more blocks to select. In this case there is a draw and the game must be started again.



## Coding

Now you have an understanding of what the following code does.

Player variable declaration: There are two players: 0 and 1. Both of them are using the same variable.

```
Dim Player As Byte
```

Remember that the game has two buttons: restart and close.

The restart button:

```
Private Sub Command1_Click()
```

```
T(0).BackColor = vbWhite
```

```
T(1).BackColor = vbWhite
```

```
T(2).BackColor = vbWhite
```

```
T(3).BackColor = vbWhite
```

```
T(4).BackColor = vbWhite
```

```
T(5).BackColor = vbWhite
```

```
T(6).BackColor = vbWhite
```

```
T(7).BackColor = vbWhite
```

```
T(8).BackColor = vbWhite
```

```
End Sub
```

**And close button, simply:**

```
Private Sub Form_Load()
```

```
Player = 0
```

```
End Sub
```

Let's see again the mechanic of the game. We have an array t

t(0) t(1) t(2)

t(3) t(4) t(5)

t(6) t(7) t(8)

Player 0 will always start first. Then player 2 follows, then player 0 returns and this is the process of the game until the possibilities are over. Each player has a color for his moves.

```
Private Sub T_Click(Index As Integer)
```

```
If Player = 0 Then
```

```
T(Index).BackColor = vbBlack
```

```
Player = 1
```

```
Else
```

```
T(Index).BackColor = vbYellow
```

```
Player = 0
```

```
End If
```

We said before that there are 8 possibilities to win: 3 vertical, 3 horizontal and 2 diagonal possibilities.

So, based on that, we need to define when a player is the winner.

For black player (player 0):

```
if T(0).BackColor = vbBlack And T(1).BackColor = vbBlack And T(2).BackColor = vbBlack Then  
MsgBox ("Player Black: WIN")  
End If
```

```
If T(3).BackColor = vbBlack And T(4).BackColor = vbBlack And T(5).BackColor = vbBlack Then  
MsgBox ("Player Black: WIN")  
End If
```

```
If T(6).BackColor = vbBlack And T(7).BackColor = vbBlack And T(8).BackColor = vbBlack Then  
MsgBox ("Player Black: WIN")  
End If
```

```
If T(0).BackColor = vbBlack And T(3).BackColor = vbBlack And T(6).BackColor = vbBlack Then  
MsgBox ("Player Black: WIN")  
End If
```

```
If T(1).BackColor = vbBlack And T(4).BackColor = vbBlack And T(7).BackColor = vbBlack Then  
MsgBox ("Player Black: WIN")  
End If
```

```
If T(2).BackColor = vbBlack And T(5).BackColor = vbBlack And T(8).BackColor = vbBlack Then  
MsgBox ("Player Black: WIN")  
End If
```

```
If T(0).BackColor = vbBlack And T(4).BackColor = vbBlack And T(8).BackColor = vbBlack Then  
MsgBox ("Player Black: WIN")  
End If
```

```
If T(2).BackColor = vbBlack And T(4).BackColor = vbBlack And T(6).BackColor = vbBlack Then  
MsgBox ("Player Black: WIN")  
End If
```

**For yellow player (player 1):**

```
If T(0).BackColor = vbYellow And T(1).BackColor = vbYellow And T(2).BackColor = vbYellow Then  
MsgBox ("Player Yellow: WIN")  
End If
```

```
If T(3).BackColor = vbYellow And T(4).BackColor = vbYellow And T(5).BackColor = vbYellow Then  
MsgBox ("Player Yellow: WIN")  
End If
```

```
If T(6).BackColor = vbYellow And T(7).BackColor = vbYellow And T(8).BackColor = vbYellow Then  
MsgBox ("Player Yellow: WIN")  
End If
```

```
If T(0).BackColor = vbYellow And T(3).BackColor = vbYellow And T(6).BackColor = vbYellow Then  
MsgBox ("Player Yellow: WIN")  
End If
```

```
If T(1).BackColor = vbYellow And T(4).BackColor = vbYellow And T(7).BackColor = vbYellow Then  
MsgBox ("Player Yellow: WIN")  
End If
```

```
If T(2).BackColor = vbYellow And T(5).BackColor = vbYellow And T(8).BackColor = vbYellow Then  
MsgBox ("Player Yellow: WIN")  
End If
```

```
If T(0).BackColor = vbYellow And T(4).BackColor = vbYellow And T(8).BackColor = vbYellow Then  
MsgBox ("Player Yellow: WIN")  
End If
```

```
If T(2).BackColor = vbYellow And T(4).BackColor = vbYellow And T(6).BackColor = vbYellow Then  
MsgBox ("Player Yellow: WIN")  
End If
```

```
End Sub
```

We hope you found it useful. You can see the source code [here](#):